

DEQ in the Classroom: Playing Hide and Seek...With Pollution!



IDAHO
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Grade Level:

Pre-K – 3

Time Required:

35 – 45 minutes. (Slightly more if the class goes outside for Step 10.)

Objective:

Children learn what pollution is, how they can spot pollution in the environment (sometimes), and what they can do to prevent pollution.

Meets Idaho State Standards:

Grade K: K.S.1.6.1, K.S.2.1.1, K.H.1.1.11

Grade 1: 1.S.1.2.1, 1.LA.6.1.1, 1.H.1.1.11

Grade 2: 2.S.1.2.1, 2.S.1.6.2, 2.H.1.1.10

Grade 3: 3.S.1.2.1, 3.S.5.3.1, 3.LA.6.1.4, 3.H.1.1.10

Meets standards in Science, Health, Language Arts

Focus:

Air, water, land, waste, pollution, pollution prevention.

Materials: (for a class of 25)

Clear pitcher of water (also need access to a sink to get more water and for clean-up)

25 clear plastic cups (one for each student)*

25 coffee stir “straws” (one for each student)*

Salt (about 1 cup)

Vinegar (about 1 cup)

Food coloring (a mixture of colors to combine to make brown/black)

Pollution photos (attached – print single sided or photos may show through)

Picture to color (attached – print single sided)

Crayons, markers, or colored pencils

*Students can also be divided into groups. If this is done, only need one cup and straw per group.

Background:

Young children tend to spend a lot of time outdoors and are keen observers of their environment. Children's health is also easily affected by environmental pollutants, as their lungs are still developing, and they breathe faster than adults, tend to spend a lot of time outdoors, and tend to have close contact with the ground and water. This activity introduces children to the concept of pollution in the environment. Children use hands-on activities to learn and observe what pollution is, use their senses to discover "pollution," and observe how some pollution can't be discovered using our senses. This concept is important for children, as the idea that something can be dirty even if it looks clean can be hard to grasp and not understanding this can result in children engaging in unsafe activities (e.g., drinking water from a stream). Young children become empowered as they learn there are things that they can do to prevent pollution.

Vocabulary:

Carpool	When several people ride together someplace in one vehicle instead of taking several vehicles.
Environment	Our surroundings (earth, water, air, land, etc.)
Pollution	Something that contaminates (hurts, makes dirty) the natural environment; usually a result of human activities.
Recycle(ing)	Transforming waste materials into usable resources. For example, paper that we don't need anymore can be made into new paper.
Waste	Any material (solid, liquid, or contained gas) that is discarded, recycled, reused, or considered inherently waste-like. Garbage.

Procedure:

Step 1. Ask students if they have ever heard the word, "pollution." If they have, ask them what it means.

Step 2. Build upon their definitions to come to a definition that pollution is something that hurts the environment (everything that surrounds us – the earth, water, air, etc.) or makes it dirty. Pollution is usually caused by people. Show them the photos of the polluted land (page 6) and polluted air (page 7; the single polluted air photo) to provide examples.

Step 3. Ask how they can tell if something is polluted. Based on their answers, discuss how sometimes we can tell if something is polluted by using our senses (looks dirty, smells funny), but not always. Often, we can't see or smell pollution. A good analogy is that a lot of pollution is like germs. Ask what they know about germs (*they get on our hands, they can make us sick, we wash our hands to get rid of germs on them*) Can we see germs? *No.* (That's why we wash our hands even when they look clean.) A lot of pollution is like this—it can make us sick or hurt the environment, but we can't see it.

Pollution often "hides"; we are going to see if we can find it. We will play "hide and seek" with pollution.

Step 4. Hold up a clear pitcher of water (fill ahead of time or let them watch you fill it if there is a tap in the room). Ask them if they think it is polluted. The answer should be "no." Ask how they can tell: looks good, smells good, they saw you fill it from the tap and know that the water should be clean, etc.

Step 5. Give each child a clear plastic cup* and pour a little water from the pitcher (a few tablespoons is enough) in each. Give each child* a coffee stir stick. Tell them we can pretend this water is anything in the environment – water from a lake or river, air, land, etc. (The idea is that the water represents anything that can become polluted; the activity is not about water or drinking water, *per se*.)

Step 6. Ask what would happen if something accidentally spilled in the water. Would it then be polluted? (*Yes, it would.*) How could you tell? *Maybe by sight, maybe by smell, but maybe you couldn't tell at all.*

Step 7. Put 2 drops of food coloring in the cups of 1/3 of the students (or 1 group) and have them stir the water. Then have them look at it and show it to their classmates. Can they tell it is polluted? *Yes.*

Step 8. Put a small amount (e.g., 1 teaspoon) of vinegar in the cups of another 1/3 of the students (or another group) and have them stir. Then have them look and show their classmates. Does it look polluted? *No.* Can they tell it is polluted even though it looks clean? *Yes. Smells bad.* Note: Don't specifically tell them to smell. Smelling something strange is not always good (sniffing some chemicals can be dangerous). Emphasize that we can often smell pollution (e.g. air pollution; use a local example if possible), but that we don't want to just stick our nose in something that we don't know and take a whiff.

Step 9. Put a small amount (e.g., 1/2 - 3/4 teaspoon) of salt in the cups of final 1/3 of the students (or the last group) and have them stir. Then have them look and show their classmates. Can they tell it is polluted? At first, maybe – the water may be cloudy until the salt completely dissolves. Discuss how the pollution seems to disappear, but it is still there (or you can't see it at all). Should they taste it? *NO. Never taste/eat/drink something that you don't know for sure is clean. Even if it looks fine, it may be polluted.*

Step 10. If possible, take the class outside to look at/smell the air and to look at the school grounds (note that this will add to the time of this activity). If not possible, have the students to look outside through a window. Does the air they see outside look clean? (Usually will be “Yes,” but might be “No,” depending on conditions). Does the ground look clean (e.g., is can they see litter?)? Ask if anyone ever visits lakes, rivers, or streams. Do the lakes/streams they see look clean? *Usually the air and lakes/streams will look clean, just like the water with the salt.* Show them the photo of the “dirty” river (page 8). Can they tell if it is polluted? (*Yes*). Show them the photo of the “clean” creek (page 9). Can they tell if it is polluted? (*No, but it still might be.*) *We don't drink water from streams, etc. (unless it has been treated) because it could be polluted (most likely is), even though it looks clean, just like the salty water. It can make you sick.*

Step 11. Complete Questions for Discussion, below, then continue with Step 12.

Questions for Discussion:

1. Remind the students that even though you've used water as an example, it isn't the only thing that can get polluted. What else could be polluted? Look for answers including air and land.
2. Why do we care about pollution? Answers may include: *We need a clean environment to be healthy, pollution looks and smells bad, animals/plants need a clean environment, etc.*
3. How do you think the environment gets polluted in the first place? Answers may include: *People, car exhaust/driving, factories, littering, dumping things (chemicals, soda, motor oil, etc.) into rivers or onto the ground, using too much fertilizer, burning garbage, not picking up after pets.*
4. How can kids help prevent pollution? Answers may include: *Walk or ride your bike instead of taking a car, carpool, encourage Mom and Dad not to idle their cars when waiting for you (shut off engines), don't*

*Or each group.

dump things (e.g., soda, paint, etc.) into streams or down storm drains, use both sides of paper, don't waste, don't litter, pick up litter, plant a tree, recycle, reuse items, pick up after your pet goes to the bathroom (poops), give away old toys instead of throwing them away, turn off appliances and lights when not using (making electricity causes pollution). **Many of these actions may need explaining to the class (what they mean, why they prevent pollution, or both), even if one student brings them up and seems to know about them.**

5. Can just one kid really make a difference? *Yes! Each person can make a difference – we can pollute or we can help prevent pollution or clean up pollution. Even though what each of us can do may be small, it all adds up.* (See Assessment/Follow-Up for suggestions of activities to help students visualize this point).

6. We talked about how we can see or smell some pollution, like when the air smells bad or we see litter, but we also talked about how we can't see a lot of pollution. How do you think scientists can tell things are polluted when we can't see or smell the pollution? *Answers may include: Use special equipment, watch for changes in how things appear, look for effects of pollution (e.g., count the bugs living in a stream; if there aren't the number or type there should be, it means the stream may be polluted and killing the bugs). There are a lot of people who check for pollution (called "monitoring") for their jobs.* **You will need to assist students with these ideas/answers, but let them come up with their own ideas first.**

Procedure, Cont.:

Step 12. Provide each child with the coloring sheet from this lesson plan (copy from page 11).

Step 13. Explain that they will color half of the picture with a clean environment (the half with the smiley face, for those too young to read) and half (frowney face) as a polluted environment. Ask how they might make them different (e.g., blue sky in clean, brown sky in polluted). Show them the side-by-side air pollution photos (page 10) to show that their picture will be kind of like this, with half looking clean and half looking polluted.

Step 14. After they are done coloring, ask students to show their drawings and explain why they colored them as they did.

Assessment/Follow-Up:

After the Activity:

- Read *The Lorax* by Dr. Seuss aloud to the class. (Available from your local library or to purchase at most book stores.) Look back at the book and look at/discuss the pictures showing the pollution the Once-ler caused. Discuss how it is up to the person the Once-ler is telling the story to (e.g., the students) to care about the environment and fix the pollution. Re-visit the question of what a kid can do to prevent pollution.
- Pick up litter on school grounds. Provide children with gloves and be sure they have close supervision to avoid touching things they shouldn't. Have kids look closely "before" and "after" or take "before" and "after" photos to show the difference they made in cleaning up pollution.
- Show how each individual can make a difference and how individual actions can add up. Pick a part of the classroom or playground that is relatively bare ("clean"). Have students take a close look and/or draw a picture of the area, or the teacher take a photo of the area. Then have each student walk by and throw one thing that they can identify as theirs (piece of paper, pencil, shoe, etc.) into the "clean" area. Have students watch the entire time, but specifically stop periodically to ask students if they can see any differences in the "clean" area (that it, it is no longer clean). One done, have students take another look, draw another picture, or teacher take another photo. Discuss how they each just contributed one item, but they ended up with a very dirty/polluted area. Then have the students do the same thing in reverse (one at a time, each student pick up what they threw in) and again discuss how each student just picked up one item, but that together they made the area clean again.
- Complete "DEQ Kids: Who is Protecting Idaho's Clean Air, Land, and Water?" Available for download at http://www.deq.idaho.gov/air/educ_tools.cfm, Student Resources or from your DEQ regional office. (DEQ regional office employees – get from your office's publications coordinator; state office employees, get from Leslie Nelson, x0383.)

Additional Resources:

DEQ Educational Tools: http://www.deq.idaho.gov/multimedia_assistance/educators_students.cfm

DEQ Kids Activity Booklet Series

Do You Care About Air? http://www.deq.idaho.gov/air/educ_tools.cfm, Student Resources

Let's Talk Trash... http://www.deq.idaho.gov/waste/educ_tools.cfm, Student Resources

Water Does a Lot For Us...http://www.deq.idaho.gov/water/educ_tools.cfm, Student Resources

Who is Protecting Idaho's Clean Air, Land, and Water? http://www.deq.idaho.gov/air/educ_tools.cfm, Student Resources

Pollution Prevention: What Can Citizens Do To Prevent Pollution?

http://www.deq.idaho.gov/multimedia_assistance/p2/citizens_overview.cfm

What Does DEQ Do? http://www.deq.idaho.gov/about/deq_purpose.cfm

Questions? Need help or additional resources? Contact:

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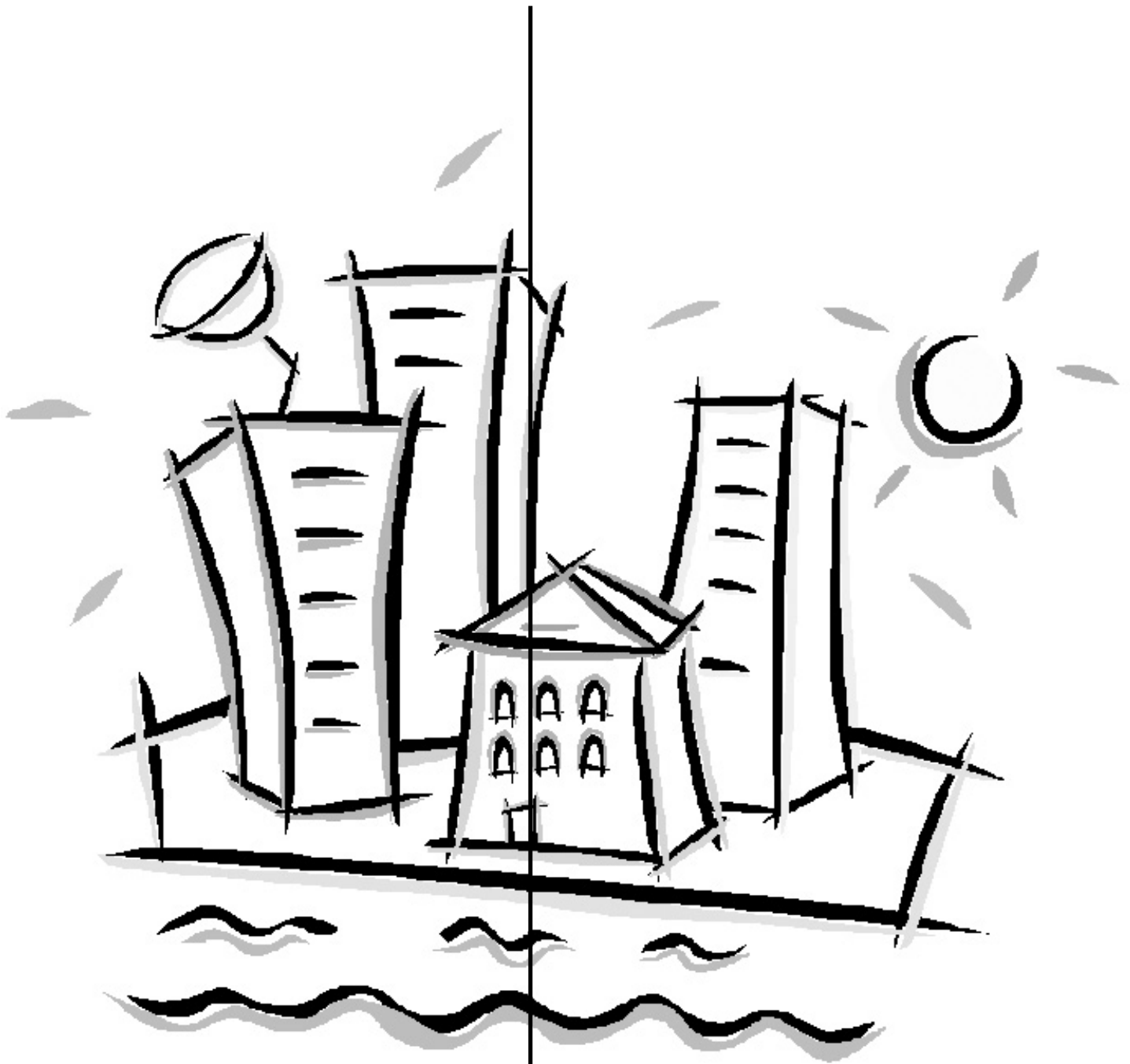












Polluted



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